

1st Meeting of the
National Climate Assessment Development and Advisory Committee
L'Enfant Plaza Hotel
Washington, DC
APRIL 4 -6, 2011

Call to Order and Welcome and Charge to the Committee

The meeting was called to order by Cynthia Decker, Designated Federal Official (DFO), NOAA and Tom Karl, Chair, Subcommittee on Global Change Research (SGCR), NOAA, who served as co-chairs of the meeting. Tom Karl welcomed and introduced distinguished visitors: Dr. John Holdren, Science Advisor to the President and Director, Office of Science and Technology Policy, (OSTP); Shere Abbott, Associate Director for Energy and Environment, OSTP; Dr. Jane Lubchenco, Under Secretary of Commerce for Oceans and Atmosphere and National Oceanographic and Atmospheric Administration (NOAA) Administrator; Dr. Rebecca Blank, Under Secretary of Commerce for Economic Affairs (on behalf of Secretary of Commerce Gary Locke).

On behalf of President Obama and OSTP, Dr. Holdren greeted the participants and thanked the National Climate Assessment Development and Advisory Committee (NCADAC) for the work they have agreed to assist with, to establish continuing national climate assessment process that is open and transparent. The NCADAC is asked to synthesize the current science, be clear about what we know and what we don't, to work with regional and economic sector interests, to evaluate the current and future implications of climate change, mitigation and adaptation options, and most important, to build a transparent and robust process to assess climate change. Shere Abbott stressed that the Administration is committed to investments in basic science as well as a significant new priority to make scientific information more easily used and useful in the context of supporting mitigation and adaptation as well as communication. Dr. Lubchenco focused on: (1) Importance of the NCA process; (2) How this assessment will be different from past assessments; and (3) Principles and expectations of this committee. She said the NCA should strive to help the nation prepare for both opportunities and impacts due to climate change. Every region of the country is represented in the committee, which also crosses disciplines and sectors, as well as government and non-profit organizations. Dr. Blank concluded this portion of the agenda by emphasizing that the NCA reports will be developed through a participatory process, evaluated by the scientific community and presented to the President and Congress. The product will be read, used, critiqued and attacked; the NCADAC needs to recognize this and assure that all claims are backed and that the members speak from their scientific expertise.

Introduction of Members

The members who were present introduced themselves along with a brief statement about their affiliations and expertise.

Background Briefing on National Climate Assessments

Tom Karl, Chair, Subcommittee on Global Change Research

Dr. Karl provided background on previous climate assessments. The 1st National Climate Assessment was completed in 2000 in response to the Global Change Research Act (GCRA) of 1990. As part of this process, there were a series of workshops within 22 regions and multiple sectors that took place between 1997 and 2000. A number of the workshop reports were not finalized, or in various stages of completion, when the 1st NCA 2000 Reports (a foundation and a synthesis product) were written by the National Assessment Synthesis Team (a federal advisory committee). The 2nd NCA was completed in 2009, and included a summary of 21 independent Synthesis and Assessment Products that were written over the previous eight years as well as regional and sectoral components.

Kathy Jacobs, Director, National Climate Assessment

Ms. Jacobs focused on the plan for the next National Climate Assessment that will include a complete report in 2013 as well as establishment of an ongoing process to produce more specific products over time. Other proposed aspects of this new approach include development of institutional capacity for assessments and decisions; inclusion of cross-cutting issues; use of existing and building of new networks of scientists and stakeholders in regions and sectors; development and deployment of methodologies for assessment and indicators of change; inclusion of international context; focus on education and communication of climate risks; and a strong web-based presence.

The GCRA has three “mandatory” components for the NCA: to synthesize, integrate and evaluate the climate science produced by the USGCRP to identify gaps in understanding; to evaluate the impacts of global change on a series of specific sectors; and to project future impacts 25-100 years into the future.

Discussion

Points made by NCADAC members included:

- The challenge will be the transition from reports that deliver scientific results to putting the information into a context that meets decision-maker needs.
- NCA needs: *flexibility* (different capacities in sectors and regions and cross-cutting) and *credibility* (high standards of peer-review; this is a challenge to remain credible but take advantage of non-traditional technical inputs, such as adaptation information, which tends not to be published in the literature); *sustainability* (creating a bottom-up process is difficult, particularly in terms of ensuring sufficient funding for sustaining such a process; sustainable communications is a particular challenge).

- What is the relationship between the sustained assessment and the America's Climate Choices study? The NCA will use these reports as well as other Academy reports to guide gaps in knowledge and as technical inputs.
- Should take advantage of ongoing federal agency activities (e.g. climate service). Inventories are being started through the "capability mapping" exercise of the USGCRP adaptation science team.
- It is important to forge a strong link back to research community/programs – and capitalize on those resources as well.
- It is a challenge to project models/climate information over 25-100 yrs; we need to recognize that there will be an iterative process to capture change over time.
- The relationship between timing of the IPCC AR5 and this report is important; we need to think about how to proceed given that new model information will be coming out shortly after the NCA report is now due in 2013.
- There is a need to use a consistent uncertainty lexicon, and a new version is now available from IPCC.

Actions:

The NCA office will prepare and provide a list of relevant reports for the NCADAC members. The NCA Office will prepare and provide a list of ongoing federal and non-federal resources and activities that can help support the assessment.

Federal Advisory Committee Act (FACA) and Charter Discussion

Alice McKenna, Department of Commerce Office of the General Counsel

Ms. McKenna provided an overview of the Federal Advisory Committee Act and discussed the charter of the NCADAC specifically. FACA was created to ensure responsibility for accountability of the government to the people. It was passed in 1972 along with FOIA and the Privacy Act. The charter is the corporate governance document; if a charge is not expressed in a Committee's charter, the responsibility of achieving that charge is not the responsibility of the group. The basic concept for advisory councils is openness – meetings must be open to public and noticed in the Federal Register 15 days in advance. Closed meetings may only be held to discuss classified information or confidential business information. Meetings of sub-groups are not subject to the same rules if they conduct preliminary drafting or preparatory work. Any conclusions or recommendations developed by the sub-groups must be brought up in a full, open public committee meeting. Public access to the records of the committee is managed under Freedom of Information Act (FOIA) guidelines, or parties may request to see documents. Ms. McKenna also reviewed the charter of the NCADAC, explaining what is covered under that document and what is not. This document is the primary document that governs the NCADAC and should always be consulted first with any question before going to the DFO.

Discussion

There was a lively discussion after this presentation. The members had a variety of questions regarding the use of email and status of working documents (not public until they go before the Committee). They were also concerned about the rules governing subcommittees and working groups. Subcommittees are formal standing bodies under the full Committee and conduct preparatory work for the Committee. Working groups are ad hoc and less formal with shorter time frames but also bring their work to the full Committee for consideration. The NCADAC operates by consensus but minority opinions are permissible and voting may be conducted if necessary. Special government employees (SGEs) cannot have substitutes sit in for them but the ex officio members, who are representing their agencies, may have substitutes. Any further questions can be brought to the DFO, who will answer them as the work of the NCADAC proceeds.

Ethics Discussion

Dana Jacobs, Department of Commerce Office of the General Counsel

Dana Jacobs of the Department of Commerce was invited to speak about the ethics rules that apply to SGEs. Non-federal members of the NCADAC are considered to be SGEs. Some of the ethics rules that apply to government employees will apply to SGEs as well. She provided a document on ethics that is available on the Department of Commerce (DoC) website and has been sent to members in an email. There is a phone number to call with questions. Adriel Harris is the attorney assigned to help this committee with ethics questions.

Discussion

A member noted that many members apply to the government for funding of their work and wanted to know if such funding be considered a conflict of interest. Ms. Jacobs responded that most academic scientists apply for funding through their institutions; it probably is not a conflict of interest because of the employment exemption. Ms. Jacobs urged the members to contact her or her colleague, Adriel Harris, after the meeting with any additional questions they might have about ethical issues.

Actions

Dr. Decker will send out contact information for Dana Jacobs and Adriel Harris to the NCADAC after the meeting.

By-Laws Discussion

Cynthia Decker, DFO, NOAA

The draft by-laws were distributed during the meeting and sent to members on the phone. Some of the language in the draft by-laws comes directly from the amended charter for the committee. Dr. Decker went through the document very briefly, pointing out the main sections and calling them to the attention of the members.

Discussion

- Primary concerns arising out of this presentation were whether all federal advisory committees have bylaws, i.e., are they required. The response was that bylaws are not a requirement but that it was thought that such a large committee as the NCADAC might use bylaws to enable it to operate more efficiently. If the Committee agrees that it wants bylaws, they could be finalized and adopted on a teleconference of the NCADAC within the next few weeks.
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- The 3 year term for individual members is longer than the 2 year charter; it is expected that the charter will be renewed and that members will stay on at least until the first report is completed. The NCA is expected to be an ongoing effort.

Actions

- Dr. Decker will check with DoC OGC about the pros and cons of having bylaws.
- The NCADAC members will send comments on the bylaws to Dr. Decker who will collate them. She will then revise and circulate another version of the bylaws based on these comments, if desired by the Committee after the results of the previous action.

Overview of Interim Strategy/Proposed Approach to NCA

Kathy Jacobs, Director, NCA

In its 2007 report "Analysis of Global Change Assessments: Lessons Learned" the National Research Council provided recommendations about how to do assessments. That report outlined both what mistakes have been made in the past and what are lessons learned for the future. Using that report and other NRC recommendations as a basis, the Interagency National Climate Assessment Task Force (INCA TF), a group of 15-18 US federal government agency representatives, developed a draft, or Interim, Strategy for the National Climate Assessment that was presented to the NCADAC for review and consideration.

This document lays out the overall concept of the new climate assessment process – a report due in 2013 with an ongoing process established that will continue after release of the report. The strategy also includes a discussion of the elements to be included in the report, the primary

participants, the structure of the overall assessment approach, and the expected products of the NCA.

Discussion

The discussion of the strategy was very broad but there were several key issues raised by the members. One of these was concern about the very tight timeline for the production of the report and the possibility that it may need to ease up or the scope of the report may need to be scaled back. Another issue was the concept of engagement with the wider community and the need to somehow certify or validate the data and information that might come in through this. The process for accepting and using data, particularly if some sort of peer review process is needed, and its implications for web accessibility and use were discussed. Another concern was how mitigation questions would be handled in the report. There were also concerns about the use of indicators and how these would be defined and incorporated as part of the assessment both in the short and long term.

Roles and Responsibilities Discussion

Tom Karl, Chair, SGCR and Kathy Jacobs, Director, NCA

There are multiple possible roles for NCADAC members, including participation in the development of all of the topics on the current version of the outline. One example is data management; it requires three foci: traceability, repeatability and accountability. Other roles involve taking responsibility for elements of the assessment: regions, sectors, and the need to look across the sectors to see their links, synergies, and sources of conflict. There is also a need for new methods for establishing scenarios, a new indicators approach, and the need to look at vulnerability and risk as an organizing concept. In addition, the NCADAC should assess the state of the physical, biological, and socio-economic impacts of climate change.

One of the key roles of the NCADAC is in the area of communication and engagement. The Committee will need to focus energy on interacting with a broad array of associations and societies to deal with thematic areas such as sea level rise, weather extremes, high impact events, and ocean acidification, among other things.

Discussion

The members had a number of concerns about the roles they will play in the assessment process. They see themselves as providing expertise on specific topics but don't think that they represent all of what will be needed. Mr. Karl and Ms. Jacobs noted that this is the reason for the engagement strategy, an effort that will identify experts and stakeholders who will play strong roles in developing the assessment. They also pointed out that there will likely be a number of

working groups formed on specific topics. These groups will include non-NCADAC experts. The members also raised the question of international connections. Although the NCA will have a global context that cannot be ignored, especially in the sectors, it will be focused on national climate issues. Rather than just updating the 2009 assessment (which is one option for 2013) it may be more important to put effort into dealing with the newer assessment issues and impacts that have not been assessed before. The ex officio federal members are expected to play a strong role in identifying agency interests and needs as well as resources to support the activities of the assessment. The topic of indicators came up again here and was the subject of additional discussion.

Outcomes from the Workshops/Assessment Process Discussion

Kathy Jacobs, Director, NCA

This presentation focused on the work that has been carried out to date on the assessment through workshops and other activities. Workshops conducted include: Scenarios, Modeling, Valuation, Vulnerability Assessment, Knowledge Management, Ecological and Physical Indicators, Regional and Sectoral Strategies, and the Outline and Workplan for the Assessment. The written reports and information provided at the meeting are summaries of what individual people stated in these workshops. They are inputs, not collective guidance or a consensus of the participants. In addition to process workshops, the NCA Office has held scoping sessions on other topics: international context, communications, and how to engage with the water sector. The NCA Office has also consulted with OSTP and each of the USGCRP agencies, the Adaptation Task Force of CEQ, Congressional staff from multiple committees, four National Research Council committees, and other interest groups. An estimated 800 individuals have participated in workshops and about 2000 people have attended presentations and other events where the NCA approach has been discussed. Regional and sectoral workshop outcomes included the following suggestions:

- Use a hybrid approach that looks at regions, sectors, and intersections.
- Conform regional boundaries to state lines, but also consider biophysical regions.
- Have a compelling story line for scenarios.
- Emphasize what is known and “what keeps you up at night” (risk-based priorities).
- Be consistent in the modeling approach with evaluation of models for across regions and standard graphics.

Discussion

Much of the discussion focused on the how the workshops have tried to engage broad communities on the NCA topics and the need to further define the use of indicators. One indicator of success for the previous assessment is that it is used by decision-makers but this is not sufficient. There are indicators of change that are critical to decision processes and this new

assessment can focus on at least some of these. Not every decision can be anticipated and supported, but if the process involves a lot of potential stakeholders, more of these can be supported in both the short and long term.

The indicator concept is a way to think about whether the nation is becoming more resilient over time, whether the pace of change is accelerating, whether critical systems (energy, transportation, and endangered species) are becoming more or less threatened. Perhaps 20 indicators would be watched over time – sea ice extent, social vulnerability in cities, rate of species extinction, etc.

Review Actions and Prepare for Day 2

The meeting concluded for the day with a quick review of actions and instructions from Cynthia Decker to potential public commenters for the following day. A few additional items mentioned by Mr. Karl but not summarized previously included:

- Looking back to the federal research program, we should identify what activities would be critically important to this NCA report or the sustained process
- Members were asked to fill out a form to indicate their areas of interest within the outline, and turn them in by 6pm Tuesday.

TUESDAY, APRIL 5, 2011

Overview and Discussion: National Indicators of Change

Overview

Kathy Jacobs, Director, NCA

Ms. Jacobs reviewed the results of the Indicators workshops and provided an overview of the proposal for this topic. The NCA Office expects that the NCADAC will create a working group dedicated to continuing the development of the indicators. This is a big commitment so it is expected that most of the work before 2013 would be about strategy and approach rather than conclusions based on the results of data from indicators. The following points were made:

- The indicators will inform decisions at the national level in a broad way.
- The audience includes Congress, public, media, and resource managers on a broad scale.
- Some indicators may only work at the national level; but others may be an aggregate of things measured at local level. The same metric might not be measured in all regions.
- Data sources are likely needed from both inside and outside the government, being aware of Information Quality Act issues with respect to the latter.

Indicators Panel Discussion

Melissa Kenney, Fred Lipschultz, and Kathy Jacobs, NCA Office

The NCADAC commented that the NCA needs to be careful to differentiate indicators of climate impacts versus indicators of climate change. It is not useful to have a long list of indicators and force them into categories. The NCADAC may need to develop a theory of change in order to develop the indicator system properly. The panel agreed that there could be both impacts and change indicators. If these are going to be relevant to people, the NCA might need both.

Public Comment Period

The comment period was moderated by Cynthia Decker, the NCADAC Designated Federal Official. Four individuals signed up to provide comments. Speakers were given five minutes each for comments.

Speakers were told they are welcome to provide statements for the record in writing to Dr. Decker or one of the NCA staff. Public comments submitted prior to the meeting and made at the meeting are contained in Appendix B.

Overview and Discussion of Outline for the 2013 Assessment Report

Virginia Burkett, US Geological Survey; Fred Lipschultz, NASA and USGCRP; Sheila O'Brien, NCA Office

Sheila O'Brien provided an overview of the NCA process to date. She asked the NCADAC to examine the INCA TF's proposed outline for content and organization and to identify necessary subjects that may have not been included for whatever reason, or if there are proposed topics that should be removed. Ms. O'Brien also outlined the requirements of GCRA and pointed out that the assessment is supposed to project future impacts out to 100 years. She explained that the initial discussions of the outline were at a workshop held in summer 2010 that included the INCA TF members and NCA staff. A Federal Register notice regarding the proposed content of the NCA was issued in September 2010. Additional input was gained from the Regional and Sectoral workshop held in November 2010.

Virginia Burkett presented the Regional and Sectoral Workshop report and the 2013 Report Outline. For the past year, the INCA TF has been planning the Assessment process, including the development of the proposed outline. There have been nine methodology workshops. The Regional and Sectoral Workshop was convened by USGS in Reston with more than 130 people and was a highly structured workshop with 12 breakout sessions. It was focused on planning the approach to conducting the assessment within regions and sectors, as well as cross-sectoral and

biophysical regions discussions. This workshop also included discussion of international linkages, with presentations from Canada, Australia and the UK, as well as the World Bank.

Fred Lipschultz presented a summary of the rest of the proposed NCA report outline including the approach to the regional components.

Discussion

The members of the NCADAC voiced a number of questions and concerns about the NCA Report outline presented. Items of particular interest included:

- the lack of a clear place for indicators of change in the outline,
- the need for an expanded international context for the report,
- the role of the business community in the report, as contributors, those being impacted, across sectors, etc.
- the definition for cross-cuts, which some felt should not be across sectors or regions but should be topics such as adaptation, mitigation, uncertainty and risk management, which cut across everything,
- the need for the role of state and local governments to be included, particularly in the context of jobs and the economy

Alternative Approaches to the Outline, Process and Scope

Bob Vallario, Department of Energy

The intent of this presentation was to highlight possible connections between agency contributions, inputs from the broad research community, and activities of the NCADAC, and to present a series of options for moving forward. The idea was to provide alternative ways of approaching both the outline and the approach to the NCA, given the dual emphasis – a 2013 report and a sustained process. There is a desire to move beyond the historical approach to Assessments and address new challenges and topics. There are multiple ways of addressing the products, in terms of individual reports, web-based products, etc. A key issue, especially given time constraints, is balancing resources with timeframe and scope. It is important to set reasonable expectations but also add significant new value.

Discussion

The members of the NCADAC discussed at length the implications of this presentation for the overall assessment process. Given these alternatives to the Draft Outline provided, it is clear that there are other ways to proceed and the NCADAC will need to decide what the way forward on the 2013 assessment is. There was concern expressed about when and how the Committee will

assess and make the appropriate decisions. It is expected that there will need to be significant input from stakeholders but not yet clear on how this will be done. The Draft Engagement Strategy should help to clarify this aspect of the process. Another concern raised was the budget available for the overall effort and how the NCADAC can make decisions in what may be a budget-constrained environment. Several of the members felt that they did not yet have enough information for these decisions to be made.

Actions:

Kathy Jacobs agreed to provide information about the strategy / proposal for stakeholder inputs (the external request for information was covered by Emily Cloyd in her presentation on Day 3).

Facilitated Breakout Sessions: Outline and Alternative Approaches (3 sessions)

The NCADAC members divided into three groups to discuss the draft outline for the 2013 National Climate Assessment Report and the alternative approaches provided by Bob Vallario. Although the results of these facilitated sessions were provided on Wednesday, 6 April, they are provided at this point in the minutes.

Jim Buizer Breakout Group Report:

This group agreed that a clear definition is needed for both the report and process in order to understand what the responsibility of the NCADAC is. The process should leverage the Global Change Research Program capabilities (as well as other groups). They also wanted clarification on the relationship between a federal climate service and long-term assessment process as well as between the IPCC and the 2013 report

Draft outline: there are multiple audiences (Congress, agencies, public) and different languages will be better suited to different audiences; this should be taken into account in report writing. Decision-makers want guidance from the assessment but the NCADAC needs to be careful in writing about not being too prescriptive.

Scope: changing the climate conversation in America should inform the outline but there is a need to ensure the committee is capable of producing what it says it will produce. There should be clarification on what is meant by producing a report that is supposed to improve decision making. The public relates to climate change and its impacts differently than government agencies and the report should reflect this.

Indicators: These should be expressed at regional levels and should be usable by stakeholders. The report should be clear about how scientists use indicators versus how decision makers use them. Indicators may help simplify the assessment effort.

Sectors and regions: The importance of regions should be emphasized throughout report. Sectors should be captured in an inter-sectoral way; GCRP already has working groups that look at inter-sectoral issues and that program could take the lead in developing integrated topics.

Timing and production cycles: The NCADAC must decide what is necessary to write report. Sections one and two can be given charges immediately. There was also consideration of the timing of the next IPCC report and how to reconcile new products that are produced after that report.

Gary Yohe Breakout Group Report:

There was a strong preference for a selective minimalist approach to the 2013 Report. The NCADAC should make it clear that risk-based approaches are being adopted, and so the NCA will be designed to speak explicitly to the requisite components – likelihoods and consequence (in whatever metric is most appropriate for decision-makers).

The 2013 Report should exploit recent assessments and offer only brief synopses when appropriate (quality judgment and availability of new science). The report should include regional chapters, but not be concerned about uneven coverage across regions. Some regional chapters may be minimal; others will be representative of evolving best practices.

The NCADAC should contemplate developing and reporting (adaptation) “readiness indicators” for sectors and (more likely) for regions (and sectors in those regions). This would be a proof-of-concept indicator that can inform states and local entities and perhaps be aggregated across a region or sector

The report should close with a section that anticipates milestones and process developments after 2013 to support a sustainable assessment process and to build toward subsequent reports.

Many in the group agreed that the report should include, in the science sections or at least as an appendix, succinct coverage of why “popular misconceptions” of climate change are not correct but this should not be done in a confrontational way (e.g., select misconceptions from survey literature rather than personal selections from skeptics’ ruminations).

It should infer, to the extent possible from the existing literature and recent assessments, the potential efficacy of mitigation over time to begin the analysis of the complementarity of mitigation and adaptation – perhaps as an interim product before the 2017 Report.

Other groups, including sector-specific trade and research organizations, should be encouraged to prepare and submit input for the NCA. However, it should be made clear that input submitted from any source external to the NCADAC will not necessarily be included in the Report (as a chapter or even part of a chapter). NCA authors will consider all inputs. The NCADAC should make clear what the criteria will be for material to be included in the report.

The development of the sustained process should begin at the same time, with particular attention paid to developing indicators and anticipating post-2013 products and milestones. This will be important so that funding agencies can support and research programs can respond to later requests for funding

The NCADAC should keep track of the “for whom” question as well as the how, where and when. The Report is transmitted to the President and the Congress but the sustained process can focus more on local and state officials. The report should stimulate the appetite for process products and activities; the longer process should inform members of Congress’ understandings of the climate-based risks that their constituents are or will be facing.

T.C. Richmond Breakout Group Report:

Audience

This group agreed that the development of the report should consider multiple audiences. Congress is the primary client and NCA needs to provide them with what they requested. The report should consider regional and sectoral information, including cross-cutting issues, particularly the addition of a new section on oceans. Once the baseline is established for Congress, the focus should be on the rest of the audiences. It should be a dynamic document. The group suggested an element in the report that addresses concerns about the accuracy of the science. The NCA could include integrated indicators to help understand major trends and use indicators for each sector, perhaps each region and state.

Architecture

An “encyclopedia approach” to the report outline will not be helpful. Rather than beginning with science, the report should start with topical elements then include new information or alarming developments. The group emphasized the need for a living document that starts now and continues as more and more information is put on the Web. In this design, not everything has to be complete before launching the website; the outline will help provide structure for the end product.

If a state or region has good information, the assessment should move forward to include it. However, this has implications for staying within the Information Quality Act guidelines.

Action:

This group requested clarification on review of NCA materials to be posted on the website, IQA review of underlying data, and review requirements for the report overall. (These issues were addressed by Anne Waple and Glenn Tallia in the context of her presentation on Day 3).

Introduction to the Regional and Sectoral Assessments Strategy

Kathy Jacobs, Director, NCA

Ms. Jacobs set the stage for framing the regional/sectoral assessments. The NCA approach to date has tried to identify regional networks that either exist or are being built, and leverage these to ensure long-term stakeholder engagement in the assessment. For sectors, the intent is to depend heavily on professional associations and other similar networks. The goal is that this assessment be a participatory process. The use of scenarios should help people in regions and sectors articulate how climate change (past, present and future change) either has or will affect them.

There has not been real engagement with the regions since the first assessment, which began in 1997. There should be a discussion with people in the regions to ensure that the Assessment is relevant to what they care about and benefits from their knowledge.

This session should initiate the discussion about moving forward with a regional strategy, leveraging existing investments (federal and non-federal) in the regions, with an integrated view to understand the past and possible futures in the regions. A goal is to have consistent, narrative understanding of how things will change in the regions.

Scenarios and Models for the 2013 Report and the Continuing Process

Modeling and Scaling Workshop Presentation

Tony Janetos, Joint Global Change Research Program, University of Maryland

Dr. Janetos presented a summary of the outcomes from the modeling workshop supported as part of the NCA process. This workshop was not limited to climate modeling; it also dealt with other types of models. The goal of the workshop was to provide some foundational information about what information is available for use by the NCA. The modeling and scaling workshop did not provide consensus recommendations, rather options and considerations for the NCADAC. There are some choices for the NCADAC.

There has been an evolution of sophistication in how the climate assessment community thinks about models and the use of models. The use of Global Circulation Models (GCMs) has changed from the 1980s to the first national assessment to the second assessment. Previous assessments have included some analysis of GCMs, but there was relatively little analysis of the downscaling techniques used. Impact models have also not been analyzed as well as the climate models have been. Whether to do a sensitivity analysis or a set of projections is a fundamental question for the NCADAC. Evaluation of alternative downscaling approaches is a major topic.

There is a mismatch in information and tools between what ideally the Assessment should have, and what will be available in the timeframe for the 2013 report. Nested global, regional, and local integrated models are the ideal, but this is very new. Workshop participants noted that there will not be resources to do new climate model runs for this analysis; hence the Assessment is likely to rely on Comparative Model Intercomparison Project 3 (CMIP3) model runs.

Scenarios Workshop Presentation

Richard Moss, Joint Global Change Research Program, University of Maryland

Dr. Moss provided a summary of the outcomes from the NCA scenarios workshop supported DOE. Scenarios can be qualitative or quantitative. They have multiple purposes but are generally meant to provide a range of future conditions based on a consistent set of assumptions. Scenarios are not intended to predict, rather they are a method of conditional forecasting based on assumptions (projecting).

There are various scenario users and types. The Special Report Emissions Scenarios (SRES) set of scenarios, taken from the report of the Intergovernmental Panel on Climate Change (IPCC) published in 2000, was shown as an example of the use of scenarios to connect data and logic from one set of models to another group of models (intermediate users).

There are several types of scenarios used in global change research. Emission scenarios are very detailed and sophisticated and are used by climate modelers. Emission scenarios are sometimes used to develop climate scenarios. However, climate scenarios can be constructed in different ways. Socioeconomic scenarios are new types of scenarios being used by the climate community. This area of research is trying to be more systematic in identifying uncertainties and the components that may have a large impact on society or be driven by society (land use, population, economics).

The 2009 Global Climate Change Impacts (GCCI) report had less outreach than the first (2000) Assessment. Two scenarios used (high and low rates of emissions) provided the broad context for the sectors. How widely were scenarios used? How effective were they in helping the

framing of climate change in the sectors and regions? These have not really been evaluated, but it seems like this could have been done more effectively.

Some lessons from prior experience: If the scenarios info isn't provided to regional and sectoral teams early, they will not be used. There are multiple challenges but the set of scenarios needs to have a wide range of possible futures, although there is a question of how wide.

Approach to Regional Climate Data Development

Ken Kunkel, University of North Carolina Asheville

Dr. Kunkel presented draft climatology for the Midwest, which could be used as a template for other regions, including a general climate description, description of key regional vulnerabilities (e.g. floods, severe thunderstorm), trends, and frequently asked questions.

The goal in the 2013 report is to produce regional climate outlooks that are scientifically sound and in both narrative and dataset form before the regional workshops occur. With this presentation he was seeking input from the NCADAC on what emissions scenarios to use and whether this is a good approach. Some possible model datasets already exist but he pointed out that there could be a funding barrier to get some of those desired. He noted that, using this approach, the assessment should be able to produce some basic climate outlooks for each of the regions pretty quickly.

Discussion

One member asked about assessing/including socioeconomic impacts and including the work of specific researchers into this assessment. The response was that there are many such indices, useful but very audience-specific and it may be difficult to use any particular one for purpose of the NCA. Another member pointed out that the regional assessments are not required by law so since the timeline for the report is so tight, do these need to be done? The response was that the regional approach is considered to be of particular use to decision-makers and there is already a commitment to take this approach in the report. Finally, it was noted that the requirement for data to be peer-reviewed does not require it to be published in a journal.

Building Climate/Society Narratives for Regions: a Case Study (NE)

William Solecki, New York City Case Study on Assessments, Scenarios and Adaptation

The New York City Panel on Climate Change found that context is important in climate assessments; NYC is interested in sustainability and creating a plan for this. The desire for the

plan was supported by many of the social transformations and pressures occurring in NYC. The goal was to connect climate risks to other ongoing policy and planning processes.

Dr. Solecki presented the framework for the New York City adaptation process: the office of long-term planning and sustainability supported by an expert panel and stakeholder task force. The panel includes knowledge-providers from academia and the private sector integrating cutting-edge information on climate risks affecting the city and what is needed to adapt. The stakeholder task force includes representatives from 40 city agencies, private companies and regional entities. The primary focus is on critical infrastructure, i.e. those assets that keep the city functioning. Important elements in success of the process were high level buy-in (Mayor Bloomberg) and having a coordinating entity (Office of Planning and Sustainability).

The New York City process has informed decision-makers and expanded their thinking. Climate change considerations have been integrated into existing programs, guidelines and strategies (e.g. changing the elevation of pumps on wastewater treatment facilities or waterfront development plans that incorporate considerations of sea level rise). Climate is only one thing that planners are thinking about, however. The climate scenario process is ongoing and the science-policy linkage is a challenge that is evolving over time. It is important to be clear about the unknowns and uncertainties and how they might play out in the decisions. The plan is to continue to monitor the adaptation decisions over the long term.

Discussion

A member asked how long it took to prepare the scientific inputs for the report. Dr. Solecki responded that it took about six months.

Review of Actions and Prepare for Day 3

Tom Karl summarized the action Items, including a couple of additional points:

There is a request for more clarity on whether the indicators are meant to be indicators of climate impacts or climate change and a need for a process on how to move forward on the outline and scenarios, on the role of the NCADAC vs. the agencies in writing the report.

THURSDAY, APRIL 6, 2011

Overview and Discussion: Engagement Strategy

Emily Cloyd, NCA Office

Emily Cloyd, the Public Participation and Engagement Coordinator for the NCA, presented an overview of the draft engagement and communication strategies that have been prepared. She noted that there are a lot of stakeholders who operate at different scales and represent different types of organizations. The participation and communication strategies are a guide for the NCADAC, INCA TF, and NCA staff. They are a resource for the broader community of stakeholders, especially those who want to take a leadership role in product development for the 2013 report, and support of the sustained assessment process.

The engagement team is developing criteria for prioritizing stakeholders in terms of who they are and how they might participate. These will be applied and tracked at individual and cross-activity levels to ensure broad overall participation, reduce stakeholder fatigue, and match stakeholders' skills and abilities with level of participation.

Another critical component of the strategy is building a "network of networks," which will extend the ability of the assessment to reach broader audiences through regional and sectoral networks that already exist or are being built for other purposes outside of the assessment itself. This would promote two-way flow of information. Criteria are proposed for selecting network partners; over 100 have been identified as possibilities. There are numerous upcoming professional workshops where the assessment will have a role; NCADAC members are requested to let the engagement team know if they can participate.

Discussion

There was an extensive discussion after this presentation. Members raised a number of concerns and had numerous questions. Some of these include:

- The need for non-U.S. pilot projects within this process was identified. Ms. Cloyd responded that exemplar approaches can be international or domestic but it is up to the committee how it wants to organize inputs coming in.
- There are pros and cons to organizing by sectors. If only the sectors defined by the law are covered, it will appear the committee is only abiding by the law and not going beyond. The list of sectors will depend on what the NCADAC decides to do with the outline.
- There was a suggestion that different stakeholder groups be asked about what they need from the NCA. There is concern that the strategy is unworkable in the given timeframe. A call should be issued for input from highest priority groups in all sectors.
- A suggestion was made that more effort should be made to engage members of the private sector in the NCA activities.

Actions

The NCA Office will provide a list of groups who have been thought about or contacted. The NCADAC members should be asked to identify 1-2 groups it thinks are important and provide additional names to the NCA Office.

Overview and Discussion: Data Management, Peer Review and Web Deployment for the NCA

Anne Waple, NOAA National Climate Data Center - Presentation

Information Quality Act (IQA)

The Information Quality Act is the law that defines the requirements for the quality of the data and information that are used for government products. The NCA will use NOAA and DoC interpretation of IQA because this advisory committee was formed under NOAA's rules. The NCA is classified under the criteria defined for the Information Quality Act as a *highly influential scientific assessment*. As such, it triggers the highest level of the Office of Management and Budget (OMB)'s peer review requirements. Thus there is stricter peer review required for the scientific data used and less flexibility. All types of information are subject to IQA, such as data, synthesized data, models, indicators, maps, and interpretive products (both written and web-based).

OMB describes assessments as interpretation and evaluation of data and information by a group of experts; they are more than just a literature review. The use of the information affects how IQA is applied. The peer review must be adequate to meet IQA standards. If the information fails to meet IQA standards it may not be used in the assessment. The costs and benefits of peer review should be considered – reviewing a single document that supports an interpretation would be worth the cost of a rigorous review; reviewing a document that is just one of many documents supporting a point may not be worth such a cost. For IQA, information of 'high quality' doesn't mean only high certainty.

Knowledge Management Workshop

Anne Waple provided a summary of results from the NCA-sponsored Knowledge Management Workshop. Some suggestions from this were: 1) convene an independent peer review panel, and 2) make use of professional organizations' web-based journals for peer review.

Web-deployment: NCA Portal

Anne Waple provided an overview of the status of the portal for the NCA. She noted that there are challenges with web deployment. Resources (people and money) are a challenge for 2013

because of the report timeline and process. There are issues of interoperability. The interagency climate portal to be hosted by USGCRP provides an opportunity to work collaboratively on a discrete set of information. Tom Armstrong, director of the USGCRP National Coordination Office, has been asked by the Climate Information and Services Roundtable (CISR) to help lead the development of the portal. The assessment will lead this effort and use the data as the first order information for the portal.

Proper data management will help achieve the transparency goals. The web will provide a number of opportunities but there are resource costs – more regular updates means more peer review over time.

Discussion

The members had a robust discussion about the level of information that would be coming in from the request for technical inputs and how these might be handled if they have not been peer-reviewed prior to submission. Several suggestions were made about mechanisms for review. The NCA staff pointed out that the process calls for a formal review by the National Academy of Sciences. Underlying reports and datasets that are not cited need to undergo review only if they are deployed by the Assessment. The NCA will provide centralized access to a distributed data so metadata is essential. It is important to link the narrative portion of the report back to the source material. We will need to consider and prioritize how to include the information, costs and benefits, and value of information.

Glen Tallia, NOAA Office of General Counsel, pointed out that overall what the law requires is a peer-review of the whole report. What this group is discussing may be going beyond the minimum legal requirements.

Members asked whether the private sector and stakeholders will be able to access the reviews and documents online and whether the reviewers will be known. The answer was yes, the reviewers will be known and the responses to review will be publicly accessible; with the web that is an option.

Glen Tallia noted that it's an overall requirement of IQA to have a pre-dissemination review. Dr. Lubchenco must ultimately sign-off that the NCA Report of 2013 meets IQA standards before she sends it to the Subcommittee on Global Change Research.

Anne Waple made a point of clarification about web deployment. The web has always been used to put a report online. This time the committee can do things differently, and deploy the information itself, rather than just the report after the information has been analyzed and synthesized into the report.

Actions

The NCADAC agreed to have principles and guidelines for peer review agreed upon by the time of the next NCADAC meeting.

Milestones and Timelines Discussion

Anne Waple, NOAA National Climate Data Center - Presentation

The purpose of this presentation is to begin to identify timeframes and milestones to get the 2013 report done. The INCA TF and NCA staff would like to see the NCADAC complete a working draft of the outline over the next couple of months. They would like to schedule regional and sectoral workshops, and have them completed by February 2012. The request for technical input would ideally be made by the end of May 2011. The proposals for modeling, regional climatology, and scenarios could be presented to the NCADAC by the end of June. This is a very aggressive timeline for the report. The timeline presented is only concerning the printed report by mid-2013; web deployment might take longer.

Discussion

Concerns were expressed by the committee that it has not had enough time to discuss how it will make decisions on documents like this. There was not enough time at the meeting, so the members agreed that there must be a process for moving forward after the meeting to make these decisions.

Summarize Comments from Breakout Sessions; Finalize Actions from this Meeting

Breakout Sessions

The results from the Break-out sessions were presented at this time, but are summarized in these minutes under the session on Tuesday, 5 April.

Actions, Roles, & Responsibilities

Tom Karl, Chair, SGCR and Cynthia Decker, DFO, NOAA

At this time the members agreed to add an agenda item for discussion of NCADAC members' organization into committees or groups for work before the next NCADAC meeting.

The members discussed the next steps and agreed that there is a need to make decisions on a number of issues and documents. There is no time at this meeting to do this so the group agreed to address these at a future teleconference meeting. In order to set up these discussions, the committee discussed how they can effectively prepare materials prior to that meeting. Cynthia Decker clarified that formal, permanent subcommittees of the NCADAC must be nominated by Dr. Lubchenco but informal ad hoc working groups do not require this. Since the committee needs small groups to work on specific issues for the short term, these do not have to be formal and can be formed at will.

Proposed ad hoc working groups agreed upon by the NCADAC are:

1. strategy and outline
2. federal agency inputs; workshops; and requests for information (includes engagement strategy)
3. scenarios and regional summaries
4. peer review and data management/portal

The members also discussed the question of the Chair and Vice Chairs for the NCADAC. Tom Karl informed the group that Dr. Lubchenco will make her choice soon. Rather than receive specific nominations for chair/vice chairs, NCADAC members may provide criteria for what Jane Lubchenco should consider in her selection of chair/vice-chair. They also may self-nominate for these positions.

Actions

It was agreed that the ad hoc groups were to be populated by email; NCADAC members should volunteer if interested in being chair; members can sign on for more than one working group.

For the NCADAC Chair and Vice Chair positions, members should send criteria and self-nominations to Cynthia Decker. She will compile this information and provide to Dr. Lubchenco.

Logistics Review (Upcoming Meetings; Intersessional Discussions)

Tom Karl, Chair, SGCR and Cynthia Decker, DFO, NOAA

Tom Karl thanked all the members of the NCADAC, the INCA TF members, and the NCA staff, including Director Kathy Jacobs. He noted several key messages from the meeting. The group should think of the “art of the possible” in completing the NCA. Source material will be drawn from agencies and from other places. There are pressing needs and the federal agencies are very anxious to get moving on these. The 2013 report should be viewed as a stepping stone to the longer term process.

There is also strong support for indicators. This is an idea that resonated with the NCADAC. Also, the web-based approach seems well-supported, as is recognition of importance of extreme

natural events. The NCADAC should view the 2009 Global Climate Change Impacts Report as a first draft, and focus on where there are weaknesses or new information that can be used to update that report. There is a commitment to IQA and the highest level of integrity if data and information. This means there is a need to draft guidelines soon for material to be included in the report.

The next meeting will be a teleconference for decisions, to be scheduled soon. The agenda for the teleconference will include all of the working group topics.

Adjourn

The meeting was adjourned at 2:00 PM.

APPENDIX A

ATTENDEES

Non-Federal Members in attendance

Name	Affiliation
Daniel Abbasi	Mission Point Capital Partners
Virginia Armbrust	University of Washington
T. M. Bull Bennett	Kiksapa Consulting, Inc. (by phone)
Rosina Bierbaum	University of Michigan (third day)
Maria Blair	American Cancer Society
James Buizer	Arizona State University
Lynne Carter	Louisiana State University
Camille Coley	Florida Atlantic University
Placido dos Santos	Arizona Dept. of Water Resources (retired)
Guido Franco	California Energy Commission
Aris Georgakakos	Georgia Institute of Technology
David Gustafson	Monsanto Company
David Hales	College of the Atlantic
Sharon Hays	Computer Sciences Corporation
Anthony Janetos	Joint Global Change Research Inst., University of Maryland
Rattan Lal	Ohio State University
Arthur Lee	Chevron Corporation
Jo-Ann Leong	Hawaii Institute of Marine Biology
Diana Liverman	University of Arizona (by [phone])
Edward Maibach	George Mason University (first 2 days)
Michael McGeehin	RTI International
Jerry Melillo	Marine Biological Laboratory
Susanne Moser	Susanne Moser Consulting (by phone, parts of all 3 days)
Richard Moss	Joint Global Change Research Inst., University of Maryland (first 2 days)
Phillip Mote	Oregon State University
Marie O'Neill	University of Michigan
Lindene Patton	Zurich Financial Services
John Posey	East-West Gateway Council of Governments
Sara Pryor	Indiana University (by phone, parts of 2 days)
Terese Richmond	GordonDerr, LLP
Andrew Rosenberg	Conservation International
Joel Smith	Stratus Consulting
Donald Wuebbles	University of Illinois (first 2 days)
Gary Yohe	Wesleyan University

(Interim) Ex Officio Members in attendance

Name	Affiliation
John Balbus	Department of Health and Human Services (NIEHS)
Gary Geernaert	Department of Energy
John Hall	Department of Defense (SERDP)
Leonard Hirsch	Smithsonian Institution
William Hohenstein	Department of Agriculture
Patricia Jacobberger-Jellison	National Aeronautics and Space Administration
Thomas Karl	NSTC Subcommittee on Global Change Research
Cathleen Kelly	Council on Environmental Quality
Chester Koblinsky	Department of Commerce
Linda Lawson	Department of Transportation
Robert O'Connor	National Science Foundation
Alan Thornhill	Department of Interior

USGCRP, NOAA and NCA Staff in attendance

Name	Affiliation
Tom Armstrong	US Global Change Research Program (USGCRP)
Ralph Cantral	National Climate Assessment Office (NOAA)
Emily Cloyd	National Climate Assessment Office, USGCRP
Cynthia Decker	Department of Commerce, NOAA
Chelsea Friedman	National Climate Assessment Office, USGCRP (Knauss Fellow- NOAA)
Bryce Golden-Chen	National Climate Assessment Office, USGCRP
Stephanie Herring	Department of Commerce, NOAA
Katharine Jacobs	National Climate Assessment Office, OSTP
Melissa Kenney	National Climate Assessment Office, USGCRP (AAAS-NOAA)
Ken Kunkel	Department of Commerce, NOAA
Fabien Laurier	US Global Change Research Program
Fred Lipschultz	National Climate Assessment Office (NASA), USGCRP
Julie Maldonado	National Climate Assessment Office, USGCRP
Julie Moore	Department of Commerce, NOAA
Sheila O'Brien	National Climate Assessment Office, USGCRP
Glenn Tallia	Department of Commerce, NOAA
Anne Waple	Department of Commerce, NOAA
Kandis Wyatt	Department of Commerce, NOAA

Others in Attendance

Name	Affiliation
Shere Abbott	OSTP
Susan Aragon-Long	DoI, USGS, INCA TF
Anjuli Bamzai	NSF, INCA TF
Virginia Burkett	DoI, USGS, INCA TF
Chris Clark	EPA
Annie Cooper	Geologist
Rebecca Blank	DoC
Melissa Forbes	DHS
James Fox	UNC Asheville
Jana Goldman	NOAA
Susan Hassol	Science Writer/Editor
John Holdren	OSTP
Karen Huyes	
Dana Jacobs	DoC OGC
Allison Leidner	AAAS-NASA, INCA TF
Maxine Levin	USDA, NRCS
Jane Lubchenco	DoC, NOAA
Alice McKenna	DoC OGC
Mike MacCracken	The Climate Institute
Carolyn Olson	USDA, NRCS, INCA TF
Toral Patel-Weynand	USDA, USFS, INCA TF
Laura Petes	AAAS-NOAA, USGCRP Adaptation Science Program
Rick Piltz	Climate Science Watch
Norman Rogers	Private Citizen
Arthur Rypinski	DOT ,INCA TF
Mike Savonis	DOT, INCA TF
William Solecki	City University of New York
Bob Vallario	DOE, INCA TF
Daniel Vosey	translating CC information public for national action plan
Margaret Walsh	USDA, INCA TF

APPENDIX B

Public Comments

Rick Piltz, Climate Science Watch

Statement by Rick Piltz to the National Climate Assessment Development and Advisory Committee

Good morning.

I direct the Climate Science Watch project here in Washington. We focus primarily on what happens on the political receiving end of climate science communication – the use and misuse of climate science in politics and the policy process. I worked in the U.S. Global Change Research Program coordination office for 10 years. I was there during the time that the first National Climate Assessment was developed in the late 1990s, with the Overview report that came out in 2000.

I think there are a few lessons from that experience that might be applicable to this new effort. I think the first National Assessment was an important first step that should have been continued. The Synthesis Team did a great job. Tom Karl co-chaired that. Other people here were involved with it – Tony Janetos, Jerry Melillo, Mike MacCracken, and others. The new administration took office in 2001 and didn't like the report and decided to bury it.

Essentially they suppressed the report. The federal agencies were directed not to make reference to the assessment in USGCRP reports, not to use the assessment report, not to continue the process. They suppressed the report. When they were criticized for doing so in the National Academy of Sciences review of the USGCRP Strategic Plan, they stonewalled the Academy. The Bush Administration colluded with what I call the global warming denial machine, without ever providing any scientific or real legal rationale for killing that report. There's an excellent history of it by Chris Mooney in the Bulletin of the Atomic Scientists, November-December 2007.

Key points:

You need to be prepared to defend your work. I'm not suggesting that the committee become political combatants. But you can't just hand in your report and walk away from it and shrug your shoulders when it's attacked. You have a professional and scientific and civic responsibility to have the courage of your own work and to defend this assessment and its process.

Norman Rogers, Private Citizen

Mr. Rogers humorously stated that he might be one of those denalists (mentioned by an earlier speaker). Mr. Rogers stated that climatology is a soft science; there are no overarching theories in the field. He stated that climate models are flawed, and even the scientist Kevin Trenberth made the statement that: “None of the models used by IPCC are initialized to the observed state and none of the climate states in the models correspond even remotely to the current observed climate.” Mr. Rogers pointed out that the IPCC models disagree between themselves radically on climate sensitivity. He said that in the 2009 climate assessment report (Global Climate Change Impacts in the United States, Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). Cambridge University Press, 2009), the word “projection” should not have been used. A projection is simply the output of a computer model and it is not prediction. People reading the report think the words “projection” and “prediction” are interchangeable. If you think you can predict the future, stick your neck out, say prediction, and stand by your predictions. Taxpayers deserve to hear predictions if you can do that. Do not hide behind computer models.

The 2009 report makes claims that are not supported by the evidence. The executive summary claims that emissions of human generated greenhouse gases (GHGs) are the cause of warming in the late 20th century. The IPCC claims this because that is what its computer models say. Yet the IPCC models cannot explain a similar warming from 1910 to 1940. Please don’t parrot the IPCC, do your own work.

Michael MacCracken, The Climate Institute

Dr. McCracken opened by complimenting the group for their role in the National Assessment. He is not a “believer” in the science but looks at the evidence. He stated that the members are analysts and thinkers and given the statement from the last speaker, they need to be very clear about how the science is done. They must consider all explanations and then choose the most logical.

Concerning descriptions of confidence and uncertainties, there have been many approaches, but they have not been evaluated for their effectiveness in communicating to the public. This should be done to make sure that the public understands what the committee members are trying to say.

Revised and Extended Comments of Michael MacCracken during the time for Public Comment at the April 5, 2011 meeting of the National Climate Assessment Development and Advisory Committee (NCADAC) (submitted May 16, 2011)

My name is Michael MacCracken, and I am Chief Scientist for Climate Change Programs with the Climate Institute, the first NGO focused on the climate change issues, and climate.org on the Web.

As a prefatory comment, I am very impressed with the progress made to date and with the selection of the members of the NCADAC. There is much to be done in a relatively short time, Thank you for the opportunity to offer a few comments on various aspects of the challenge ahead of you, and I hope that my comments, many based on experience with the 1997-2000 and the 2008-2009 US assessments, will be helpful.

- 1. The use and choice of words will be very important. As one example that I comment on in response to the comments at some at the meeting about being or not being “believers” in climate change, scientists such as myself would say that, literally speaking, we are not “believers” in the science, and I would hope the members of the NCADAC are not as well. Rather, scientists and other experts are really analysts that consider evidence (e.g., observations, etc.) and make evaluations, and this is quite different than just “belief.” Basically, scientists and other experts consider the evidence and seek to develop the explanation that best explains the evidence and theoretical understanding (or, even more strictly, the explanation that leads to the lowest degree of difference between observational evidence and theoretical understanding). It seems to me, given the state of public dialogue, that it will be important for the report to make very clear how it is coming to conclusions and findings, and how the scientific and expert process differs from just believing.*
- 2. On dealing with levels of confidence and uncertainties, I agree with Richard Moss that this is essential. While a variety of approaches have been used, there has been very little evaluation of their effectiveness in conveying the seriousness and level of scientific understanding of various issues. The remedy to this will couple to the first point—the nature of how science functions and what uncertainties mean and don’t mean need to be address as part of the communication effort. [And please do not talk about degrees or levels of “certainty;” we are either certain or we are not. There are degrees of uncertainty and degrees of confidence in the results, but not degrees of certainty.]*
- 3. On the notion of making the report “bulletproof.” While it is important to be very clear on the level of understanding on various aspects of the issue, this should not mean that results that are not well established should be excluded from the report. In particular, I would urge that you be very careful about making judgments based solely on the traditional statistical testing approach of scientists with its value-based focus on there being a strong statistical basis for establishing that there is a high likelihood of not being wrong, even if this means that vital indications and insights will end up being delivered to*

decision makers well after the results may be useful. Our often-expressed experience in the First Assessment was that stakeholders do not want scientists or other experts filtering the information they get—they are very used to dealing with information that is not certain and they made clear that they want to make the decision if the information is or is not well enough understood to be used in their particular application. So, what they want is a clear explanation of what is understood and they want information about the relative likelihood of even the direction of the expected change. Basically, let the public know about the smoke, and don't hold back providing information until the structure is completely engulfed (making sure, of course, that what is being seen is explained).

- 4. On overall coordination of the regional and sectoral efforts, I would urge being careful to avoid imposing too much top-down coordination on the regional and sectoral teams and on your various partnering organizations. While some coordination is necessary, it can sometimes seem like top-down management when impacts tend to be best understood at the local and regional levels. Impacts vary by region and sector and many of the partners are further along than the US Government in impact studies, which is coming to the table with very modest resources. While it makes sense to draw from them in a coordinated way, the diversity of approaches and perspectives can be a very valuable means of identifying and generating key insights. Our experience in the first assessment was that it worked better to encourage and, in essence, to provide carrots, than to force compliance with sticks.*
- 5. On the history of government assessments, there were assessments before the First National Assessment—this was not at all an empty space, as some listings and diagrams have suggested. EPA carried out a multi-region prototype assessment in the late 1980s, OTA carried out one in the early 1990s and the USGCRP was heavily involved in two regular IPCC assessments and a couple of special IPCC reports, including one on regional impacts, before the First National Assessment. Thus, there is actually a rich history of expected impacts and that part of the timeline should not be shown as empty with respect to information made available for Members of Congress and others. Similarly, the Arctic Assessment of 2004 provided a lot of useful information regarding US presence and interests in the Arctic and the climate analyses and projections actually extended down across much of North America. In addition, as we have learned in the past couple of winters, what happens in the Arctic affects the US. There is also another assessment no one has mentioned, and that is the Technical Supporting Document done in support of EPA's recent Endangerment Finding—it evaluates and synthesizes the relevant parts of the IPCC, Arctic, and Second Assessments. I would urge you all to read both the Endangerment Finding and the Technical Supporting Document, which was prepared by leading government scientists like Tom Karl and covered climate change as well as impacts on the US.*

6. *EPA's Endangerment Finding (the finding itself and the Technical Support Document underpinning it) is also important to read because it is an example of a report in which the US Government draws on assessment reports such as the NACDAC will be preparing and comes to a policy-related finding. Another such US Government report, which has quite a different, more cautious tone, is the report on the Social Cost of Carbon that derives the value used in official cost-benefit studies in evaluating regulatory and technology choices. Workshops have been held on its shortcomings, and the report is to be redone in future—your report will provide valuable input.*
7. *On stakeholder participation in the process, for the First National Assessment, the Director of OSTP sent personal invitations to attend the regional workshops to the governors, members of Congress, and, as I recall, the leaders of state legislative bodies. And, in many regions, the response was positive, with representatives of different agencies representing the governors and staff and even some elected officials also attending.*
8. *On distribution of the final reports, etc. When the final reports from the first national assessment came out, we mailed copies to all the governors offices, to members of Congress, to the list of official libraries (about 750), to science attaches at embassies, to resource managers at national parks, to the regional and sectoral teams for distribution, media, etc., etc. We also worked out an arrangement to have the final report published by Cambridge University Press (free copies had no bar codes so they could not be turned into the publisher, and we agreed to a slight restriction on free distribution, something like one copy per person not involved in the process or a government employee or contractor) so that the hard copy report was widely available, at low cost, on a long-term basis (it was also freely available over the Web). As I recall, about 17,000 copies of the first national assessment overview were distributed. By contrast, the US purchase of the Arctic Assessment was about 1,000 copies and so few were available and the cost through Cambridge University Press was high.*
9. *On use of various studies indicating the potential costs of climate change, much of the discussion is really of the costs of mitigation alone and do not include the costs of impacts or their alleviation in the models used; others include only a percentage of GDP based on the change in global average temperature and some recent studies reported at the joint EPA/DOE gathering on improving estimates of the Social Cost of Carbon make clear that such generalized estimates often significantly underestimate the costs of impacts calculated at finer scales. There are now starting to be specific calculations of impacts, but there is a tendency to focus pretty much only on the potential direct costs of damages. With climate change now recognized as a threat, entities are starting to invest*

in building resilience. It is really important in the impact assessments to present both the costs to reduce vulnerability and the costs of not building resilience—both are costs of climate change to society. Basically, we can pay now to build resilience or pay later to recover from the impacts. I think this is understood here, but my impression in reading the draft IPCC Extremes Report is that they report a major uncertainty in projecting impacts because, not only are there uncertainties in the climate projections, but there are uncertainties in whether actions will be taken to reduce vulnerability, and so it is concluded that the projections are very uncertain. Please be careful to explain all of this carefully.

- 10. On weather versus climate. While this is said to be a climate assessment, changes in the thirty-year average conditions are not nearly the only information that is needed. What affects people is the weather, in particular the ranges and extremes, the changing likelihood of various types of events—storm tracks, precipitation extremes, heat waves (and the heat index), and more. Echoing results presented to the committee by Dr. Jacobs averaging results over long times or large regions can lead to significant loss of information and underestimating of the actual consequences and situation to be faced. For example, the last assessment indicated that the annual number of tornadoes in the US does not appear to be changing, but there may well be shifts occurring in where and when tornadoes are occurring; such information can be important and provide guidance for those who might need to build “safe” rooms (there was a recent article about such activity occurring in Minnesota since the occurrence of a historically unusual tornado outbreak, with the public sensing that times may be changing). Or on precipitation, report shifts in patterns for wet and dry regions, not just that there is not much net change over the US in the areas that are wet and dry--averages can hide a lot of interesting information for impact studies, which generally need very localized estimates.*
- 11. On reporting on extremes, as Prof. Gary Yohe indicated, small risks of large impacts can be very important in economic analyses and overall decision-making (after all, we all buy fire insurance). Our experience with corporate involvement in the First Assessment was that most corporations (and communities) have reduced their vulnerability to a large fraction of the historic range of fluctuations in order to ensure they do not lose market share by being out of service when their competitors are up and running. Given this resilience, corporate decision makers and planners wanted to be provided information about changes in the likelihood of extremes that might shut them down. That is challenging information to be highly confident on, but they seem interested in even hints of what can be expected.*
- 12. On the spatial scope of the Assessment: Physically, it is important to note that the US is not just 48 states, or 50 states, and then the continental shelves. It is essential to add in*

several Caribbean islands and also the Pacific Trust Territories that the US is responsible for. The US also includes over 550 domestic dependent nations that elevate tribal lands to virtually the status of states, and that also provide Native Americans with some special rights regarding access to water, fish and other natural resources from public lands. For many Indigenous Peoples, they are much more closely tied to the environment than the average citizen, and their needs and challenges merit attention. In addition, every US embassy is US property, and indeed US citizens and businesses are located all over the world, and it could be argued the report should be covering their interests as well. The US is not an island in the world—we are an integral part of it.

- 13. The challenges facing the more vulnerable groups and communities also merit special attention. The US Conference of Catholic Bishops adopted a very interesting statement¹ on this, focusing on impacts on equity (so rich versus poor, US versus other countries, and the present versus future generations) and stewardship—directly challenging the notion of making decisions based primarily on overall economics. In this regard, I would suggest special attention be paid to those who will be working outdoors as laborers, the poor who often have homes for which air-conditioning is neither affordable nor practical, Indigenous Peoples, park rangers and resource managers, and others in special circumstances—be careful not to limit the focus to those who spend most of their time in air-conditioned homes and offices. The experience in previous assessments has been that benefits and opportunities, if any, tend to be spread broadly and quite thinly, whereas impacts can be focused and quite severe. In considering these, failure to disaggregate can hide important issues of equity.*
- 14. The failure to treat linkages to the rest of the world has been a critical shortcoming of earlier assessments. In the first assessment, a question from farmers and ranchers at one of the first regional workshops was not about how the climate would change in their region, but how climate change would affect their competitors. The world is connected through trade and investment in many ways, we depend on many imports (coffee and its caffeine boost being just one) and we depend on other nations being able to purchase our exports, we share important resources like water, fisheries, and migrating species, a health problem anywhere can show up here, Americans live and travel around the world, and come from around the world, keeping linkages to their home nations and feel obligated to help with environmental refugees. Virtually none of these issues has been addressed. We in the US simply cannot hide, nor should we.*

¹ Available at <http://www.usccb.org/sdwp/international/globalclimate.shtml> . In interests of full disclosure, I was science adviser to their effort.

- 15. Please make clear that climate change and its impacts are here now—this is not a distant problem. This is most obvious in the Arctic, but also along the edges of climatic zones, in subsiding coastal regions, etc. Many in the US like to think they are experiencing variability, and so talk about droughts—which may well be a misleadingly optimistic view of the initial stages of an important shift to a very different climate.*
- 16. On the timeline for issuance of the NACDAC’s report—as in 2000, June 2012 is in the middle of the Presidential election cycle. One would hope that release of the draft would lead to a constructive discussion, but this has not been the history. For the Arctic assessment we waited until after the 2004 election, and the reception and discussion were much more respectful and insightful for all. How best to handle this will be a challenge.*

Thank you very much for your attention—and many are wishing you great success in your efforts.

James Fox, University of North Carolina, Asheville

Dr. Fox indicated that his applied research group deals with public entities and decision makers from the local to regional level. What the clients for these organizations are telling them is that there is an impact on their operations as a result of the 2009 National Climate Assessment report. The Global Climate Change Impacts report, commonly called the “blue book”, is being used as a primary reference by planners. They are now looking for the next steps beyond this excellent report.

He stated that the NCADAC has a very good strategy and framework for the next National Climate Assessment but there are some weaknesses. The decision makers are looking for a more direct way to apply the assessment to their sector and region. The current report lacks consistency in its vocabulary for impacts, vulnerabilities, and indicators. The end users would find the 2013 report more useful once this consistency is attained.

**Eric A. Davidson, Senior Scientist, The Woods Hole Research Center and Alan Townsend
Professor of Ecology and Evolutionary Biology, University of Colorado**
(submitted in writing prior to the meeting)

Dr. Kandis Wyatt
NCADAC Designated Federal Official (DFO)
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Dear Dr. Wyatt:

We wish to submit this written comment in response to the Federal Registry publication of March 2, 2011, entitled "National Climate Assessment Development and Advisory Committee; Request for Nominations and Notice of Meeting."

We write in our capacities as current and past North American Coordinators of the International Nitrogen Initiative (NAINI) and also as the PI and co-PI of a recently funded National Science Foundation Research Coordination Network (NSF-RCN) on Reactive Nitrogen in the Environment.

We are pleased to see in the publication of "NCA Report Series, Volume 4: Planning Regional and Sectoral Assessments for the National Climate Assessment" that one of the cross-cutting issues that may be addressed in the NCA is "Ecosystems, Agriculture, and Carbon/Nitrogen Cycles." We are writing to offer our assistance in helping the NCADAC to identify a mechanism to address this complex topic within the time-frame of the planned NCA report. Our group includes agronomists, terrestrial and aquatic ecologists, atmospheric chemists, groundwater experts, and epidemiologists, who come from academia, government, NGOs, and industry. We have been working on integrative approaches to understanding the cross-sectoral issues related to excess N in the biosphere, including its interaction with the C cycle and with climate change.

We are considering devoting the first year's activity and the majority of the year-1 budget of our new NSF-RCN to a cross-sectoral assessment of linkages between human alteration of the N cycle and climate change, with a particular focus on the USA. Several of our collaborators, including some members of our RCN's steering committee, are scientists at federal agencies, so we are expecting their participation and hoping for co-sponsorship of one or more workshops on the topic. In the past, our workshops have yielded papers in peer-reviewed scientific journals. In this case, we propose that another primary product of this effort would be a report delivered to the NCA-DAC on "Ecosystems, Agriculture, and Carbon/Nitrogen Cycles." To ensure that the report will be received and used, to facilitate participation among our agency colleagues, and to attract needed co-sponsorship by agencies and private foundations, we seek a specific invitation from the NCA-DAC to deliver the proposed report. The report would emphasize documentation of the peer-reviewed literature on the topic. The NCA-DAC would then be free to extract from our report whatever portions that it finds useful for the upcoming NCA report to be published in 2013. We would welcome a dialogue on procedures and approaches that would make our report as useful as possible, including whether the report should be issued by our own NA-INI center, which would be the most expeditious option, or if a more formal interagency working group mechanism is needed.

Unfortunately, time constraints for both the NCA and for the organization of our RCN require that we need to act relatively quickly to produce this cross-cutting issue report within the needed time-frame. We would appreciate any guidance that you could provide at your earliest opportunity, and we hope that you will invite us to deliver this report as supportive material for your use in the NCA.